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ANALYSIS OF CLAYS.

The following brief notes of qualitative and quantitative analyses, taken from my laboratory record, will be of interest to some, and give a general idea of the chemical composition of some of the clays found in so great abundance in this state.

In this form of mineral wealth, Kansas is rich, the list embracing every variety in inexhaustible quantities, from pure white porcelain clay to common marl, and in time it must develop a large and varied manufacturing industry.

Many of you have heard of the Osage City ochre, which is found in an immense bed, varying from twelve to twenty-four feet in thickness. Its composition is—

Silicate of Alumina.....	Nearly 98 per cent	Silicate of Magnesia.....	Trace
Silicate of Lime.....	Small amount	Sesqui-oxide of Iron.....	Small amount

In that portion of the bed worked at the present time, the percentage of oxide of iron is a little larger than the sample gave from which the analysis was made.

At Council Grove is found an ochre with the same constituents :

Silicate of Alumina.....	Large amount	Silicate of Magnesia.....	Trace
Silicate of Lime.....	Small amount	Sesqui-oxide of Iron.....	Moderate amount

This ochre has exactly the shade of the *Spanish brown* largely used as a mineral paint, and is in every way equal to it.

The extent of the deposit, its geological position, and its physical characters, I do not know.

Over the eastern half of the state are distributed strata of a light, bluish clay, varying from one to two feet in thickness, lying immediately over or under the coal, commonly called fire clay, but none that I know of are sufficiently pure to furnish first-class refractory fire brick, suitable for furnace linings. Some sufficiently pure, however, will, I believe, eventually be found. Clays sufficiently pure for the manufacture of stone-ware, and other articles that are not required to resist an intense and prolonged heat, are known.

A so-called fire clay found at Council Grove, contains—

Silicates of Alumina and Iron.	Carbonate of Lime.	Sulphate of Lime.	Chloride of Calcium.
	Carbonate of Magnesia.		

The following are found at Carbondale, No. 1 above a coal bed, No. 2 beneath it :

	No. 1.	No. 2.
Water, given off at 212° F.....	8.50	3.00
Organic matter.....	2.00	2.00
Silica.....	27.50	48.60
Alumina.....	39.50	21.85
Protoxide of Iron.....	18.05	16.70
Sulphate of Lime.....	3.90	6.80
Sulphate of Magnesia.....	0.55	1.05
	100.00	100.00

These last from Carbondale are good average samples of the so-called fire clays of Eastern Kansas.

Recently there has been discovered on the line of the K. P. R. W. a beautiful pure white porcelain clay, that remains perfectly white after being subjected to a strong heat. It is apparently pure enough for the manufacture of a fine quality of porcelain, and for many other uses in the arts. The deposit is said to be extensive, uniformly pure and easily worked, characters which if true, make its great value fully assured. Its composition is —

Silicate of Alumina. | Silicate of Lime (a trace). | Peroxide of Iron (a trace).

A very pure sample of native rock salt was brought me from the southwestern part of the state, consisting of —

Chloride of Sodium.....	92.20	Sulphate of Soda.....	4.91
Chloride of Magnesia.....	0.81	Silica	2.08
			100.00

The locality from which it was taken, and the extent of the deposit, are unknown to me.

The following analysis will be of general interest, as it shows how powerful diaphoresis can remove from the body by perspiration, mineral compounds that are not ordinarily eliminated through the skin. A gentleman who had been suffering for three years from general debility, decided to try the effects of the Turkish bath. After a few trials finding his condition improved, he desired to know whether any noxious mineral matter was being eliminated by the sweating process, and brought me a sample of perspiration for analysis. After standing a few hours, a residue settled, which was examined separately. The result was as follows :

FILTRATE.

Reaction neutral.	Water.	Organic matter.	Chloride of Sodium
Sulphates of Soda and Potassa.		Phosphate of Lime.	

RESIDUE.

Organic matter.	Alumina.	Sesqui-oxide of Iron.	Phosphate of Lime.
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Attention is called to the presence of alumina, sesqui-oxide of iron, and phosphate of lime, substances that we would not expect to find in perspiration, and which ought not to be eliminated from the system faster than they are naturally excreted. This case must be an exceptional one, I think, as the Turkish bath, for properly-selected cases, is a valuable tonic and remedial agent, that invigorates the system, not a debilitating agent that abstracts the sources of its vitality.

WM. H. SAUNDERS, M. D.

LAWRENCE, October, 1874.